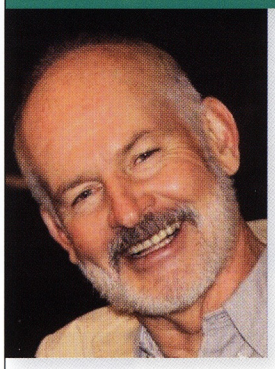

Compiled by
Geoffrey M Knight

Indirect direct RESIN BRIDGE

Direct resin bridges either with or without fibre reinforcements are useful clinical procedures that provide patients with minimal intervention solutions to replace missing teeth. Fibre reinforcing enhances the predictability of this technique improving with the thickness of the fibres.

However, some patients have an extremely heavy bite and despite increasing fibre thickness, direct pontics will inevitably fail. For such patients, reinforcing the bridge with a small precast metal frame has been used to provide long-term clinical stability.

After successfully placing these bridges for over 30 years, this author has come to the conclusion that where possible the use of a precast metal frame requires less tooth removal than the thicker fibres and substantially improves the clinical predictability of the prosthesis.

As the metal reinforcing bar is embedded within the composite resin a 'triple tray' alginate impression provides sufficient clinical accuracy and enables the laboratory to place the frame within the occlusal table.

CLINICAL PROCEDURE

The patient presented with a vertical fracture of an upper first bicuspid that required extraction. Prior to removal of the tooth a small groove was prepared on the lingual surface of the adjacent canine with small incisal and gingival extensions at the mesial margin to improve resistance to lateral occlusal forces. Following this a triple tray impression was taken with alginate to enable construction of the metal frame within the occlusion (Fig 1).

A week later initial healing of the socket has occurred and the cast metal frame with a Rocatec coating (3M ESPE) to mask the dark metal colour had returned from the laboratory (Fig 2).*

After seating the patient, the healing socket was checked and following removal of the Cavit (3M ESPE) dressing in the canine, the metal frame is tried in place to confirm it fitted and did not interfere with the occlusion of the lower dentition (Fig 3).

The small ring in the pontic frame improves retention of the composite resin and can be used to place a reinforcing fibre in particularly heavy occlusions (Fig 4).

PLACEMENT OF THE ABUTMENT

- Etch the preparation of the canine for five seconds, wash and dry.
- Place a Mylar strip between the canine and the lateral incisor.
- Insert a small amount of resin modified glass ionomer cement (RMGIC) into the preparation prior to inserting the abutment.
- Next smear a further layer of RMGIC over the abutment and pontic followed by a layer of composite resin to match the colour of the canine.
- Fold the Mylar strip over the lingual surface of the canine and pontic then ask the patient to close in a retruded position.

**Technical advice on the construction of the metal frame is available from Barry Smith at Andent Laboratories, phone: 03 9650 6766.*

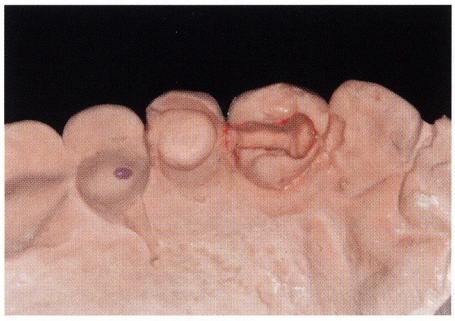

Fig 1. Model showing tooth preparation on the canine.

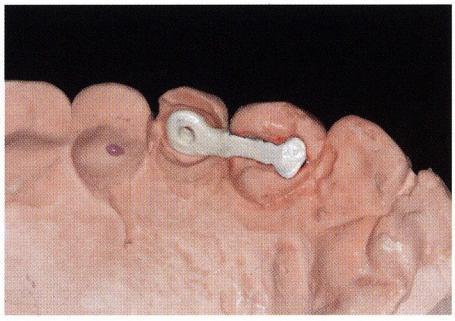

Fig 2. Model with metal frame in position.

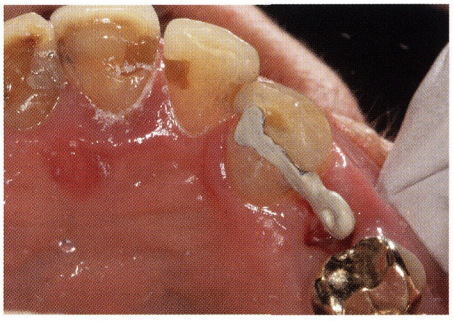

Fig 3. Metal frame in position prior to cementation.

Fig 4. Buccal view of pontic showing retention ring for pontic.

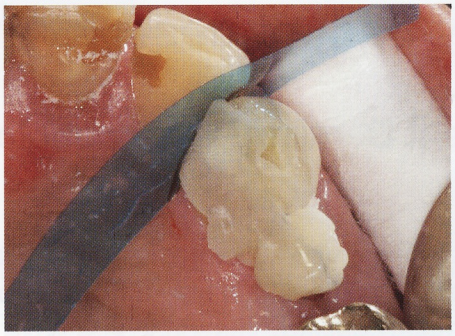

Fig 5. Lingual aspect showing cementation of pontic using a Mylar strip as a proximal and occlusal matrix.

Fig 6. Buccal view showing RMGIC bonded between composite and metal sectional matrix to form gingival floor.

Fig 7. Buccal view showing fabrication of distal margin of the pontic using a Mylar strip and large paper point.

Fig 8. Buccal aspect of completed bridge.

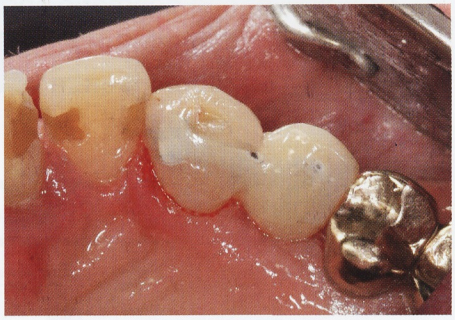

Fig 9. Occlusal view showing pontic and abutment components of bridge.

• Photocure the buccal aspect of the pontic and abutment for five seconds to initially cure the restoration then ask the patient to open and cure the lingual surfaces for a further 20 seconds

Biting down on the Mylar strip seats the abutment frame onto the preparation and creates a thin layer of composite resin over both the abutment and pontic that requires little further occlusal adjustment (Fig 5).

Construction of the pontic

• Place a thin metal sectional matrix below the pontic.

• Insert a RMGIC into the space between the pontic and the matrix to form the gingival contour of the pontic.

• With a pair of tweezers hold the matrix with a slight positive pressure on the gingival tissues.

• Photocure buccal and lingual aspects of the pontic for 20 seconds.

The RMGIC prevents growth of bioload beneath the pontic and is easier to contour the gingival margins than composite resin (Fig 6).

• Place a paper point interproximally between the pontic and the second bicuspid.

• Insert a Mylar strip.

• Create the distal margin of the pontic by placing composite resin into the buccal and lingual aspects of the pontic between the strip and the pontic.

• Fold the Mylar strip to create the distal margin, making sure there is contact between the bicuspid and the pontic.

• Photocure for 20 seconds.

The paper point holds the Mylar strip in place and assists with the development of the cervical embrasure (Fig 6).

The pontic and abutment surfaces were contoured using diamond points and discs to clear the lower occlusion and form the bicuspid. Final polishing was achieved with rubber cups and fine discs (Fig 8, 9).

The indirect direct resin bridge is a conservative and predictable restoration. Clinicians may choose to have their laboratory construct the pontic and this is a sound alternative technique. It is important to prepare small incisal and gingival extensions in the abutment arm opposite the pontic to prevent future rotation of the bridge.